DEVELOPING A HIGH RISE RESIDENTIAL FIRE SAFETY PROGRAM

LEADING COMMUNITY RISK REDUCTION

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Appendices Not Included. Please visit the Learning Resource Center on the Web at http://www.lrc.dhs.gov/ to learn how to obtain this report in its entirety through Interlibrary Loan.

Abstract

The problem investigated was: how can a fire safety program for New York City high rise residential buildings address the needs of residents, building management and employees, and New York City Fire Department [FDNY] firefighters who respond to those buildings in order to improve fire safety for all? The purpose of this applied research paper was to develop a fire safety program template for high rise residential buildings that recognizes and addresses the different perspectives of these three groups in order to improve the effectiveness of such a fire safety program.

Historical and action research methodologies were used to answer questions about the current FDNY fire safety program for high rise residential buildings; determine the key groups that need to be involved in such a program; define how to best address the needs of each of these groups in a model program; identify where these needs differ and where they coincide; critique the current FDNY program; and design a program to encourage the key groups to work together to improve fire safety.

The procedures used in this project determined that three groups -- building residents, building employees and firefighters -- are key to the success of a high rise residential fire safety program. Fire prevention and fire safety literature was analyzed to determine what needs for fire safety and barriers to success exist for the key groups. Past and current FDNY fire safety programs for high rise residential buildings were reviewed and critiqued. A model program addressing the needs of the three groups was drafted, tested on focus groups and presented to each key group. Three presentations resulted, one for each of the three key groups. A guide for using this process to develop individualized fire safety plans for other high rise residential buildings was outlined.

Recommendations developed from this project focused on reforms and new initiatives needed for FDNY to lead and cooperate in fire safety improvements in high rise residential buildings.

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Introduction

The problem investigated was: how can a fire safety program for New York City high rise residential buildings address the needs of residents, building management and employees, and FDNY fire companies which respond to those buildings in order to improve fire safety for all? The purpose of this applied research paper was to propose a template for developing a fire safety program for high rise residential buildings that recognizes and addresses the different perspectives of these three groups in order to improve the effectiveness of such a fire safety program. The project will conclude by putting forward suggestions for improving the FDNY fire safety program for high rise residential buildings in order to make FDNY fire safety initiatives more effective in the form of a "model" program. Using historical and action research methodologies on this project, the following questions were investigated:

1. What is the current FDNY fire safety program for high rise residential buildings?
2. What are the key groups that need to be involved in a high rise residential building fire safety program?
3. What does each of these groups need from a fire safety program?
4. How could those needs best be addressed in a model program? Where do these needs differ and where do they coincide?
5. What problems and deficiencies exist in the current FDNY fire safety program for high rise residential buildings?
6. How can the program be designed to encourage the key groups to work together to improve fire safety?

Background and Significance

The criticism of the New York City Fire Department [FDNY] that Edward Blum wrote in 1971 for the "Rand Report" rings as true for FDNY today as it did over thirty years ago:

> [T]raditions still dominate; the only road to the top of larger fire departments is from within, and few training programs are available to teach management and organizational skills. Moreover, even among officers, the acculturation toward putting out fires is so decided that many of the best men [sic] prefer field command even to top administrative or staff jobs…Further…fire departments are essentially line-operating agencies. As students of bureaucracy have noted, even without external pressures such agencies are often ill-equipped in outlook, skills and organization to undertake novel or significant change. They are usually ill-equipped to undertake efforts that involve more than minimal uncertainty and risk. The rewards for success within the organization – and its political setting – are too small, and the price of failure disproportionately high.

Both fire prevention and fire safety education continue to be regarded as far less desirable assignments and much lower priority than fire suppression by the majority of FDNY members. This is borne out in the difficulty the Department has in convincing anyone – from chiefs on down to firefighters – to volunteer for these assignments. S. Dawe, former FDNY Chief of Fire Prevention (personal communication, February 10, 2004). Very few incentives exist for such assignments – promotion, "medals" and other forms of recognition are tied to suppression rather than prevention activities. The low priority

assigned to fire prevention and fire safety is also reflected in the small amount of resources allocated to these activities (see below).

Despite claims that fires are "down" in New York City, the statistics show that fires continue to occur in steady numbers with consistent numbers of civilian and firefighter fatalities. In 2002 and 2003, the most recent years for which statistics are available (2001 was not chosen because the statistics were skewed by September 11, 2001 and its aftermath), New York City experienced:

	2002	**2003**
Structural Fires	**26,248**	**27,105**
Non-structural Fires	**25,315**	**24,015**
Non-fire Emergencies	**170,867**	**178,156**
Medical Emergencies	**158,461**	**173,694**
Malicious False Alarms	**45,651**	**41,018**
All Hands	**2,686**	**2,948**
2nd Alarm	**217**	**186**
3rd Alarm	**26**	**42**
4th Alarm	**15**	**22**
5th Alarm	**2**	**4**
Greater Alarm Total	**2,946**	**3,202**

Note. Structural Fires - fires that occur in structures.
Non-Structural Fires - examples are brush, rubbish or automobile fires.
Non-Fire Emergencies - utility emergencies and other emergencies that are not fire or medical related.
Medical Emergencies - are selected life-threatening emergencies that engine companies respond to as First Responders.
Malicious False Alarms - are calls that units respond to where there was no one who reported an emergency.
All Hands - a fire or incident where a minimum of four fire units are fully engaged.

Greater Alarms – incidents where All Hands or higher alarms (2-5) are used. The number of units used varies but all these fires are considered serious by the FDNY.

(*FDNY, n.d. Citywide Performance Indicators for 2002 and FDNY, n.d. Citywide Performance Indicators for 2003)*

Likewise, the number of New York City civilian fatalities has held steady over the last five years, with some spikes and dips in the numbers. Because of the skew that the number of civilian deaths at the World Trade Center in 2001 puts into the statistics, the statistics presented are for the first quarter of the year for each of the past five years:

First Quarter Data 2000-2004

Year	1st Quarter Fire Fatality Totals (January through March)
2000	**58**
2001	**40**
2002	**30**
2003	**44**
2004	**31**

(FDNY, 2004)

In New York City, as in the rest of the United States, most fire fatalities occur in "low-rise" (in New York City, this is defined in most cases as six stories or less than 75 feet) buildings. So why direct any fire safety efforts at high rise buildings if the number of fatal fires is relatively small relative to the total number of fatal fires? As the United States Fire Administration [USFA] points out in its Topical Research Series (2002), there are several reasons to focus fire safety attention on high rise fires. The USFA's research concluded:

- Each year, an estimated 15,500 high rise structure fires cause 60 civilian deaths, 930 injuries, and 252 million dollars in property loss (because of reporting parameters, the USFA defines “high rise” as greater than five stories).
- Although residential high rise death rates are half those of residential structures in general, residential high rise fires are more injurious. The USFA hypothesizes that this lower death rate may be due to the role of smoke alarms (more likely to be installed and activate in high rise residences than in smaller residences).
- Three-quarters of high rise fires are in residential structures.
- Fires that originate on an upper floor (30 or above) tend to cause a disproportionate share of injuries and fatalities. Although 45 percent of fires originate above the thirtieth floor, these fires account for 55 percent of injuries and 60 percent of fatalities.
- High rise fires are inherently more difficult for the fire service.

In addition to citing these findings as reasons for undertaking high rise fire safety programs, the USFA points out that in the wake of the tragic events of September 11, 2001, high rise fires and high rise firefighting tactics have assumed a more prominent role in the consciousness of the United States fire service and American society as a whole. The implication of that statement is that with the public’s attention so focused on high rise buildings, the opportunity to do fire safety education for those types of buildings is enhanced.

FDNY Fire Safety Education Efforts

The City of New York Comptroller (2004), the city’s chief fiscal officer, puts the FDNY Fiscal Year 2004 budget at 1.1 billion dollars – of which 1.02 billion is for

"personal" services (salaries and benefits for personnel). According to the FDNY 2003 Annual Report, only 17 million out of the 1.1 billion dollar FY2003 FDNY budget was allocated to fire prevention and fire safety – meaning that New York City spent less than two dollars and fifty cents for fire prevention for each of its seven million residents last year (that does not include people who come into New York City to work)(FDNY, 2004). Also according to that Report, approximately 1800 fire safety presentations reached an estimated 252,000 people in 2003 – adjusted for total population that accounts for one in 28 people or 3.6 percent of New Yorkers (FDNY, 2004).

According to the Comptroller's audit and the FDNY 2003 Annual Report, FDNY is made up of approximately 11,000 firefighters and fire officers, 2,800 Emergency Medical Service employees and 1500 civilian support workers. As of 2003, only twelve full duty firefighters or officers and 355 civilians – or 1.23 percent of the FDNY workforce -- were assigned to the Bureau of Fire Prevention (FDNY, 2004). These numbers had dropped from FY2002 because of budget cuts reducing the FDNY civilian workforce. The assignment of FDNY personnel to fire preventions and fire safety education has dropped despite studies showing that the higher the percentage of the Fire Department workforce dedicated to fire safety and the lower the ratio of fire safety employees to the population, the fewer fire-related deaths (Comptroller, 1998).

Current FDNY high rise residential fire safety program

In 1999, the FDNY began a new fire safety education campaign that was prompted by the enormous amount of attention to fire safety (or lack thereof) that resulted from a fire in a high rise "fire proof" residential building at 124 West 60th Street in Manhattan on December 23, 1998. Now commonly referred to as the "Culkin fire"

(because actor Macaulay Culkin's family apartment was the source of the fire), the fire resulted in four civilian fatalities and nine firefighter injuries. News reports emphasized that the fire loss was exacerbated by tenant error – delay in report of the fire, leaving the door to the fire apartment open and tenants leaving their apartments unnecessarily (Sachs and Flynn, 1998, p. B1).

Less than one week before, on December 18, 1998, three firefighters were killed fighting a fire at a high rise "fire proof" residential building at 17 Vandalia Avenue in Brooklyn. Although that fire attracted much less media attention initially, after the Culkin fire reporters pointed out the similarities between the two incidents – delayed reporting of the fire and a tenant who left the fire apartment door open when fleeing (Sachs and Flynn).

The Culkin fire was not the first high rise residential fire to attract media, public and official attention. A 1988 blaze on the East Side of Manhattan led to four deaths. A description of events on East 50th Street shows an uncanny resemblance to the Culkin fire. Three dead residents were found in stairs and landings; the other fatality was found just inside her apartment with the door open. Building employees and a visitor attempted to extinguish the fire before reporting it. Heavy smoke permeated the building although fire damage was confined to the first floor fire apartment and lobby. The stairs were useless for evacuation because of the smoke. Residents who stayed in their apartments behind closed doors were unharmed (Kirby, 1994).

On March 22, 1987, a fire at 1295 Fifth Avenue ("Schomburg Plaza") in Manhattan which began in the building's compactor chute led to the deaths of seven tenants – three jumping to their deaths from the 33rd floor and four others burned beyond

recognition. The unusual step was taken of presenting facts from a criminal investigation into the fire to a grand jury. Although the grand jury found that those fire fatalities could have been prevented and fault was widespread, no person or entity was held criminally responsible for the deaths. However, the grand jury report stated that the jury was deeply angered by the facts learned in the course of the investigation ("Unpublished Report," 1988). Subsequently, many of the jury's recommendations were carried out, including amending the New York City Fire Prevention Code to require that the Fire Department annually inspect all building compactor chute sprinkler systems and that all compactor rooms contain a diagram of the sprinkler system. However, today many New York City firefighters are unaware of those requirements and the tragedy that produced them.

In legislative history to amendments to the New York City Fire Code, the New York City Council noted that the Culkin fire and the Vandalia Avenue fire led City officials and local media to focus on fire safety in residential buildings. (Local Law 10, 1999, p. 5). In interviews done immediately after the Culkin fire, residents of the building complained repeatedly about their lack of knowledge about proper procedures to follow in event of a fire. (Sachs and Flynn; Jacobs, 1998, p. B5; "Residents Sue," 1999, p. B2; "Landlord of High Rise Sued," 1999, p. B2). Also immediately, the City Council began to offer legislative proposals for sprinkler and alarm requirements for high rise residential buildings. The proposals also required *all* landlords of residential buildings other than one or two-family homes to prepare and distribute to occupants a fire safety plan and other information regarding fire safety and fire prevention. A fire safety plan would have to be posted in each dwelling unit. The Fire Department was asked for its opinion and offered a legislative proposal of its own (Local Law 10, 1999).

The passage of Local Law 10 required the installation of sprinklers only in new or substantially renovated residential construction (but still not one and two-family homes). The legislation also required that the owner of *every* residential building (except one and two-family homes) develop and distribute to building occupants and building service employees a Fire Safety Plan containing the following:

- Basic information about the building including construction, different ways of exiting the building and a description of the fire safety systems in the building
- A list of all the exits and emergency fire safety/evacuation instructions
- Basic fire prevention and fire preparedness measures that will reduce the risk of fire and maximize safety in the event of fire

Building owners were also required to post a notice of the building's fire safety and evacuation procedures on the inside of each apartment entrance door (similar to instructions on hotel/motel doors) and near the building's mailboxes.

In addition to the fire safety legislation, then-Fire Commissioner Thomas Von Essen began to plan for a fire safety education program focusing on high rise residential buildings. Initially, the Commissioner's vision for the program involved taking senior Lieutenants out of the firehouses to perform full-time fire safety education lectures in high rise residences in the Lieutenants' administrative districts (where their fire companies did building inspections). The thinking behind this proposal was that the senior Lieutenants would be more familiar with their inspection areas and more comfortable with public presentation. Although many FDNY fire safety projects and programs – for instance, a short-lived boiler inspection program – have typically been

staffed by newly promoted Lieutenants, Commissioner Von Essen felt that the more senior Lieutenants would provide a better service in this case. When it was suggested that newly promoted Captains should staff the proposed high rise program, the Commissioner rejected the idea. Although Captains would have offered all the advantages to the program (and maybe more) of the senior Lieutenants, one possible explanation for why that suggestion was rejected was because of the higher costs of Captains. The management of the program was assigned not to the Fire Safety Education unit or the Fire Prevention Bureau but to the Operations Bureau (D. Burns, personal communication, February 1999).

The first information provided to the field unit Lieutenants expected to present this program was the arrival in 1999 of "Residential High Rise Fire Safety Program" folders (attached to hereto as Appendix G). These materials were developed by the FDNY Bureau of Operations without the input of the Fire Department's own community relations units. Five folders were sent to each unit with high rise residential buildings. No fire safety education training was provided to the Lieutenants expected to distribute these materials to the buildings in their districts.

After I saw the content of the written materials being distributed and had asked some questions about the administration of the program (but before the program kicked off), I went to the director of the program then-Chief of Operations Donald Burns and offered to help with the program. Chief Burns told me that the program was in place and the Department did not need help or an evaluation of the program (one of the services I offered). Shortly after the high rise residential fire safety program began, Fire Department headquarters began to ask for reports from the Lieutenants in the field re the

contacts they had been making (form attached in Appendix G). Before I had even had a chance to go out in my district, Operations suspended the program indefinitely in May 1999 (P. Ganci, personal communication, May 18, 1999). Although no official reason for stopping the program was offered, the rumor in the field was that Operations was disappointed in the actual number of buildings being visited by Lieutenants – records indicated some Lieutenants apparently visited only one or two buildings in nine hours (a day tour) or repeatedly visited the same buildings. Lieutenants I spoke with were disappointed in the lack of direction given to them regarding the program (D. Atlas and J. Walsh, personal communications, May 1999). Criticisms voiced included the Department's failure train the lieutenants and to translate fire safety materials into Spanish and other languages common among building maintenance workers in New York City.

On September 11, 2001, the collapse of three high rise buildings at the World Trade Center (WTC1, WTC2 and WTC7) had several different effects on FDNY efforts to improve high rise residential fire safety. For a time, FDNY fire safety programs were reduced or put on hold due to the loss of so many FDNY firefighters and FDNY's focus on very pressing concerns such as recovery of remains, replacing lost and injured personnel and training new firefighters/officers, promotion and replacement of key agency leaders, investigation of causes of the collapse, a focus on "terrorism" training, etc. But at the same time, due to the high visibility of the World Trade Center disaster, the public's awareness and concern about the dangers of high rise building fires was highly elevated – not only in New York City but around the world.

Since September 11, 2001, the Internet has been flooded with fire service website information re high rise commercial and residential fires. Although website resources range somewhat, most include a "brochure" that mainly explains to tenants what to do in event of a fire and some fire prevention tips. (e.g., New York State, 2004; Pasedena [CA] Fire Department, n.d.). A few are "Homeland Security" all-hazards oriented. Many mention the World Trade Center. The FDNY webpage on "High-Rise Safety" is among those that specifically cite the World Trade Center catastrophic collapse but, without further explanation, states "we still recommend you follow the safety guidelines" of staying in your apartment unless the fire originates in that apartment (FDNY, n.d, *High-Rise Safety*). New Haven's guidelines on their Fire Department website, on the other hand, more specifically address concerns after the Trade Center about Stay or Go, but also end up recommending that tenants stay (New Haven Fire Department, n.d).

In some ways, despite the public's increased attention to the dangers of fires and other hazards (e.g. bombs or chemical-biological weapons) in high rise buildings, fire safety education for high rise buildings was made more difficult. As was pointed out in a recent *New York Times* article by Dwyer (2004), after the collapse of the World Trade Center, the public has become skeptical about the advisability of remaining in a burning building and/or following the instructions of building personnel (e.g. a Fire Safety Director). After all, many people who ignored instructions to stay in the South Tower (WTC2) survived while those who followed those instructions perished. In addition, the public and FDNY's focus have been on commercial high rise buildings rather than residential high rise buildings. The general advice of the Fire Service to "stay where you are" seems to the public to be at odds with common sense.

Perhaps most importantly, the focus of the public, elected officials and FDNY was shifted to *commercial* high rise buildings. Several relatives of firefighters and civilians killed at the World Trade Center formed the "Skyscraper Safety" campaign. Focused exclusively on commercial high rise buildings, these determined advocates recruited fire safety and high rise experts, squeezed funding out of Congress, and pushed forward building code initiatives and safety studies -- 18 million dollars was appropriated by Congress for a National Institute of Standards and Technology (NIST) study of high rise buildings (V. Dunn, personal communication, September 24, 2004). The World Trade Center Task Force, appointed by Mayor Bloomberg and chaired by the head of the New York City Department of Buildings, came up with twenty-one recommendations to improve fire safety in high rise commercial buildings, fourteen of which were recently adopted into law. Although almost all the new law's provisions dealt with engineering and construction features of high rise commercial buildings, there was one new provision requiring an evacuation plan for non-fire emergencies (New York City Office of the Mayor, 2004; New York City Department of Buildings, 2004). The FDNY offered no independent plan for improved fire safety for either commercial or residential high rise buildings to the World Trade Center Task Force, the City Council or the Mayor's office (R. Spadafora, personal communication, September 28, 2004).

The 2004-2005 FDNY Strategic Plan specifically lists development of high rise *commercial* building fire safety initiatives as one of only two fire prevention strategic goals for this year. Although it seems it would have been easy to include high rise residential buildings in this initiative, those occupancies were omitted (FDNY, 2004, *FDNY Strategic Plan*).

The current FDNY high rise residential fire safety program

Slowly, FDNY's departmental fire safety education efforts resumed after September 11, 2001. In the ensuing three years, FDNY had five different Chiefs of Fire Prevention. The current FDNY high rise residential fire safety program is staffed by full and light duty uniformed firefighters and fire officers under the direction of the Chief of Training. The current program works as follows. When a residential building requests that the Fire Department conduct a fire safety presentation, one or more firefighters/officers assigned to the unit visit the building to obtain information about the building from building management – usually this involves a walk-through with the building superintendent. The firefighter/officer may also telephone the local fire company to inquire about problems with the building, recent fires, and Critical Information Dispatch System [CIDS] data on the building. Then the firefighter or officer schedules a verbal presentation with the residents or cooperative/condominium board of the building (S. Jones, personal communication, September 20, 2004; A. Mancuso, personal communication, September 3, 2004).

Currently, there are no written templates for developing the information from building personnel or for presenting the information to employees/residents. The information presented by the FDNY fire safety unit about the building is very generic. The presentations to building management and residents are not really tailored to individual buildings. The involvement of the local fire companies is also very limited. No "pre-fire plan" is developed for the building for the use of first responders as a result of the current program. The first responders' knowledge of the building is not enhanced

by whatever information the fire safety education team develops on their visit(s) to the building.

The fire safety handouts given by FDNY fire safety education presenters to building management and residents fail to answer clearly what is one of the biggest, if not *the* biggest question in the public's minds about high rise fires: do we stay or do we go? After the Culkin fire and after the first World Trade Center attack in 1994, "experts" (including FDNY spokespeople) were repeatedly quoted as urging people in "fireproof" buildings not to evacuate in event of a fire. After the September 11, 2001, many questions were raised in the media about the wisdom of that advice in light of the second World Trade Center attack. Today, New Yorkers continue to be very confused about evacuation procedures in high rise fires and emergencies.

FDNY publication "Fire Safety in High Rise Residential Buildings" [#3] (attached in Appendix F) does the best job of explaining evacuation procedures in the event of a fire but it still creates uncertainty by its use of the term "fireproof" and failing to address what to do if you live in a "non-fireproof" building. Further on the face of that handout, there is no information about how to determine if your building is "fireproof." In fact, the handout gives the erroneous impression that if your building is eight or more stories, you can be assured it is "fireproof" construction – certainly not the case for all older high rise residential buildings and commercial buildings converted to residential use. This generic information would be even more questionable for buildings in New York City which are not required to comply with the New York City Building Code – e.g. buildings financed by the New York State Dormitory Authority or the Port Authority (which was the case for the World Trade Center).

More confusion is created for civilians if they read two other FDNY fire safety handouts typically given to high rise building management and residents. In "Fire Safety in Multiple Dwellings" handout [#7] (attached in Appendix F), the handout fails to clearly answer the question of whether people should evacuate *their particular building* in the event of a fire. Rather than tell people whether in fact the building they live/work in is "fireproof" or "non-fireproof," the FDNY expects civilians to either read a long and confusing explanation of building construction (last page of handout) and determine for themselves which kind of building they live/work in, or to remember to look for the building information section of the fire safety plan their landlord is supposed to provide. And then they are asked to figure out for themselves if it is better to leave or stay in their apartment/work area.

FDNY fire safety handout "What To Do If There Is a Fire" [#2] (attached in Appendix F) creates additional confusion by advising people to "Exit your apartment or house ASAP." This publication makes no distinction between "fireproof" and "non-fireproof" residences.

New York City continues to experience high-profile high rise residential fires. And residents and firefighters continue to be killed and injured at these fires (Raftery, Santos, and McPhee, 2004; and "28 Firefighters Injured in Blaze," 2004).

By developing a new proposal for a FDNY high rise residential fire safety program, this project will help the FDNY accomplish four goals:

1. Provide FDNY with a template for individualizing fire safety plans for building residents and employees.

2. Create a model for cooperation in the development and implementation of these fire safety plans between residents, management and employees, and the Fire Department.
3. Provide FDNY fire units with basic emergency response plans for individual buildings in their response area.
4. Reduce injuries and fatalities through better development, implementation and evaluation of fire safety plans and fire safety education.

This applied research project relates to Leading Community Risk Reduction course units' emphases on fire prevention, fire safety education, developing and building coalitions, and affecting strategic change through models and management. Various class materials were reviewed for suggestions for strategies and process steps (e.g., FEMA, 2003, and exercises used in class to plan, implement and evaluate projects). In organizing and evaluating the outcomes of this project, I tried to apply the many steps we practiced as exercises in the class. This project also applies the research principles taught in Executive Development as well as that course's units on leadership and organizational culture.

This applied research project supports the USFA operational objectives of: reducing loss of life from fire of the public (although not specifically directed at children and the elderly) and firefighters; promoting within New York City a comprehensive, multi-hazard risk-reduction plan led by a fire service organization; and proposing a way to respond appropriately in a timely manner to emerging issues. This research could also encourage improvements in the operations and safety of other emergency service organizations. Many such organizations look to FDNY for ideas for programs. By critiquing past fire safety programs and proposing a better template for a new fire safety

program, this project may be able to reduce the number of civilian and firefighter fatalities and injuries that are caused by high rise residential fires.

Literature Review

The literature review for this project included reports, studies, articles and interviews with subject-matter experts intended to answer the following questions.

1. What are the key groups that need to be involved in a high rise residential building fire safety program?
2. What does each of these groups need from a fire safety program?
3. How could those needs best be addressed in a model program? Where do these needs differ and where do they coincide?
4. What problems and deficiencies exist in the current FDNY fire safety program for high rise residential buildings?
5. How can the program be designed to encourage the key groups to work together to improve fire safety?

Groups that should have an interest (stake) in a high rise residential building fire safety program include the obvious: residents, building owners and employees, and the fire service. Perhaps not so obvious are the interests of city government, the insurance industry, tenant and building owner associations, insurance companies, code development organizations (e.g., the National Fire Protection Association [NFPA]), etc.). While recognizing that the interests of the less "obvious" groups may often win out over residents, the fire service and even building owners, particularly when it comes to influencing legislation, rule-making and political deal-brokering, this paper will focus on the needs of the building residents, building owners and employees, and the fire service

as the groups whose life safety are most directly impacted by high rise residential fires (Schaenman, 1989).

What do high rise residential building residents need from a fire safety program for their building? The most obvious need for residents from such a program is information and motivation that enables residents to act "correctly" in the event of a fire or emergency in their building. Literature that posits general theories about human behavior and fire loss such as Rardin and Mitzner (1977) asserts that the sociological concept of environmental cues determines human behavior in a fire – people conform out of a desire to be "correct" and the definition of correct is determined mainly through comparison: "[W]hen people find themselves in ambiguous situations, especially ones in which they are anonymous, they tend to relinquish personal responsibility. They merely behave as suggested by the cues in the environment around them. The cues define appropriate behavior." (p. 30). If "the authorities" (government, building owners, etc.) encourage or discourage particular behavior for a long enough time, the reaction will become part of the culture. Rardin and Mitzner hypothesize that the reason the U.S. fire fatality rate is so high is because Americans suffer from "frontier affluence:" having been endowed with abundance of all resources for so long that economic pressures have not demanded care and frugality, Americans believe that "there is always more where that came from." (p. 32). Another "cultural" explanation for such high fire losses in the U.S. comes from Bahme (1967) and (1976), who cites legal barriers.

Studies of fire loss in other countries and other areas of the United States may point the way to understanding the particular needs of New York City residents. When studying different countries' residential fire death rates, some authors suggest that the

major factor in differences among fire experience is the degree to which fire prevention – including safe behavior and built-in fire protection – is emphasized. Schaenman (1993). concludes that personal responsibility for fire safety accounts for lower residential fire death rates in the United Kingdom, Netherlands and Japan. The importance of fire safety education in Hungary was demonstrated when the Hungarians stopped their mandatory fire safety education and saw their fire deaths rise 70 percent over the next eight years.

Studies of other areas of the United States such as Bertrand (1976) and Munson (1977), focused on economically-disadvantaged communities which were at high risk for fire. Lack of community, lack of fire safety training, careless behavior, few firefighting facilities and an attitude of fatalism toward fire, were all cited as contributing factors to the high rate of residential fires in these neighborhoods. In his study of Memphis, TN, Jennings (1996) concludes that there is little correlation between fire losses and the resources invested in a fire department – that socioeconomic and environmental factors ("community characteristics") are the primary determinants of fire losses. After reviewing various social science studies of fire loss, Jennings concludes that more public fire education is the most effective means for reducing the residential fire problem – but Jennings also believes the fire service should not be responsible for public fire education because it does not have a thorough understanding of the fire problem.

What does the Fire Department need from a fire safety program? As pointed out above, the Rand Report's thirty-year old conclusions about internal problems (cultural barriers) FDNY faces in developing and implementing fire safety programs are just as true today as then. Jennings (1996) made similar points when he analyzed why the Memphis Fire Department failed to reduce residential fires. The specifics he cites are:

1. Fire Department culture disparages non-suppression tasks.
2. Prevention is viewed as threatening the jobs of firefighters.
3. Fire Department leaders, promoted through the ranks, remain attached to the firefighter job.
4. Labor unions increase the power of the firefighter rank.
5. The great majority of the organization – technical and managerial – are engaged in fire suppression.
6. Fire prevention practices are primarily to assure largely uninformed public/elected officials.

From these studies, one can conclude that the Fire Service needs motivation/rewards, training, more resources, research (to make a convincing case to elected officials, et al.) and a change in "culture."

Looking at how the needs of building residents, staff and the Fire Service differ and coincide in the study undertaken by the Council on Tall Buildings and Urban Habitat (1992) researchers concluded that the outcome (fatalities and injuries) of a tall-building fire is often governed by human factor rather than building features or "engineering" and that human factors are more critical than in low-rise buildings because there is less margin for error in safe exiting. This is particularly true where the tall building depends on the functioning of staff for performance (e.g. high rise residences) – the actions and reactions of building staff are thus extremely important.

The Council on Tall Buildings also stated in this study that building occupants, building management and operating staff, and fire-service personnel are all affected differently in a high rise residential fire, and each faces a different set of threats. This

study also pointed to human behavior phenomena that should influence any fire safety education program such as: 1) the strong tendency of people to move toward familiar people (such as family and friends) and familiar places (such as their usual entrance route) during evacuation; 2) individuals respond quickly to ambiguous cues whereas intact family groups do not evacuate until there is a clear sign of threat; and 3) when faced with a fire threat, an individual's behavior continues to be governed by roles and rules operating prior to the fire.

Levin (1984) made similar points when he concluded that the choice of an escape route is determined by the human tendency to choose a familiar route, even if it is poorer (e.g. used to enter the building); and people fail to consider or even notice an unfamiliar route. He also noted that given ambiguous cues (e.g. smoke odor), people are readily influenced by the behavior of people around them. Often people will not respond until there is a second cue (e.g. an alarm). The solution Levin proposed is to regularly conduct emergency evacuation drills using alternative routes.

The FDNY could have looked to its own experience with Local Law 5 (fire safety in office buildings) in developing proposals for residential high rises. Jennings (1994) explained that because the staff and occupants of high rise buildings often need to be self-sufficient for longer periods of time than in smaller buildings, preparations for emergencies requires planning and training. Local Law 5's requirements of two-way communication of every floor with the Fire Command Station, a fire safety plan filed, fire alarms connected to a central monitoring station, trained and certified Fire Safety Director in the building, tenants trained by the Fire Safety Director, and regular drills – could have offered substantial guidance for legislation and fire safety education for high

rise residential buildings. High rise commercial experience shows the importance of designing communication systems where total evacuation is not contemplated.

The importance of good communications in the event of an emergency in a high rise building was also emphasized by Glass and Rubin (1979). The authors recommended redundant auditory and visual systems, as well as cues for the visually handicapped (which in a fire is everyone).

There is a considerable body of literature on building community-based fire safety education programs. While it is impossible to summarize everything, suggestions put forward by Rossomondo (n.d.), Kulenkamp (1994), Chubb (1999) and Schaenman (1987) made similar points: know your audience(s) (research), work in partnership and empower the various groups, pre-test and refine the message/program, prepare programs to be rolled out when public attention is focused (striking when the iron is hot), and *evaluate* the program.

Both past and current FDNY and other fire service fire safety and fire prevention literature (including websites) have already been described and discussed as part of the "Background and Significance" section of this paper (as part of the history of previous and current FDNY fire safety and fire prevention efforts for high rise residential buildings). The content of this literature is consistently similar – it was almost always written by the fire service *for* residents (primarily), with occasional references to building management/employees (Phoenix, n.d.). Occasionally, a number of "non-fire" groups have posted high rise fire safety information on their websites after fatal fires in high rise buildings (e.g., Council of New York Cooperatives and Condominiums, 1999, after the Culkin fire; Skyscraper Safety Campaign, n.d., after the World Trade Center collapse).

This literature review reinforced some thoughts about high rise fire safety that I had developed as a result of 23 years in the New York City Fire Department. As many of the authors of the literature cited above point out, the three "audiences" for fire safety information – residents, building employees and firefighters – rarely talk *to* one another in terms of trying to develop an all-hazards program that would allow all three groups to cooperate and coordinate their actions in the event of an emergency. Fire safety and fire prevention literature tells one groups what *they* should be doing but rarely tells each group what the other groups will be doing (so that all groups work in concert). Each group shows little evidence that it is thinking about how barriers and difficulties that the other groups have in acting on fire safety information should influence the behavior of the other groups. For instance, does building management apply what it knows about the ethnic and living pattern history of its tenants to how it disseminates the required tenant fire safety information? From the literature, it seems that the answer is usually "No." Does the FDNY or other Fire Departments translate fire safety information into Chinese, Spanish, Russian or other languages spoken by the residents and building employees? The answer is often "No." Do residents consider that the Fire Department's response will be delayed if residents clog all stairways when evacuating?

In addition, the literature shows a pattern of community (civilian and Fire Department) response to a serious high rise residential fire which often fails to create lasting improvement in fire safety in those buildings – the same mistakes are repeated over and over. The pattern often appears as: people (civilians and/or firefighters) die in a high rise residential fire; the media devotes attention to the fire; sometimes, "sparkplugs" (people who are angry or hurt by the fire's losses) take action (lawsuits, push for

legislative change, use the media); there is public and governmental reaction (including pressure for legislation); a "task force" may be formed to study the issues raised; the fire service "reacts" (usually the fire service is asked for its opinion but often the fire service shows little leadership in terms of suggesting change); economic pressures operate to resist changes that cost building owners, residents, other economic interest groups; some improvements may be made, others are deemed "impractical;" a new headline appears to grab attention and changes developed in response to past tragedies may be forgotten.

Despite the enormous barriers to change reflected in the literature, the literature review demonstrates that incremental improvements in fire safety have occurred over time – although perhaps not as fast and as comprehensively as fire safety advocates would wish. This literature also influenced my thinking about what steps should be taken to develop a fire safety program that truly addresses the needs of the three target groups and takes into account real life barriers to change, thereby enhancing the chances of the program's adoption and success. The work by Phillip Schaenman was particularly helpful in enumerating many ideas for improving fire safety. And the Council on Tall Buildings study and the work by Levin discussed several important aspects of human behavior that I tried take into account in designing a fire safety program.

Procedures

The literature cited above was analyzed to determine what "needs" for fire safety and barriers to fire safety programs existed for the three "key" groups. Past and current FDNY fire safety programs for high rise residential buildings were reviewed. Then the following procedures were followed to develop a "model" program.

Various historical and potential "partners" were reviewed to determine what "outside" resources could be leveraged to support emergency planning. City Council members and other influential community leaders were contacted over a period of weeks before the program started. The purpose of these initial contacts was not only to develop leads for a likely building to serve as the prototype but also to establish early contacts should those community stakeholders need to be approached subsequently for support.

The prototype developed for the "model" high rise residential fire safety program consisted of a three-sided program intended to have the Fire Department, building residents, and building management and employees all interested and contributing to the program's success. *All* three groups need to be responsible and *all* three groups need to be invested in seeing that the program succeeds. All groups are involved in partnership because successful risk reduction needs to involve the entire community – not just a single agency such as the Fire Department (FEMA, 2003). Adapting the "Understanding Risk Reduction" activity in the FEMA manual (2003), the following barriers were identified:

Residents	**Staff**	**FD**
No personal responsibility	No personal responsibility	Turf protection
Lack of information	Lack of information	Inexperience with fire prevention
General public apathy	Lack of career incentives	Lack of career incentives
Language problems, physical disabilities	Language problems	Resource shortage
Lack of time to participate	Labor issues	Labor issues
Do not know neighbors		Lack of authority; need legislation
		Failure to evaluate program

The first barrier that I addressed was each group's particular "excuse" for passivity – the reasons cited in the first row of boxes. I emphasized to all the groups that emergency planning and safety is a partnership – not the responsibility of just a single agency such as the Fire Department. My intention was to treat community groups and residents, and building management/staff as active partners for fire safety rather than as *passive* members of a target audience by soliciting their help in developing the program. The intent of the program was also to develop awareness in the three groups of the needs of the other two groups. The model program would also take cultural differences of the target audiences into account, pre-test materials, encourage continuing relationships between the partners, and analyze results.

In addition to reviewing other researchers' analyses of what is "needed" by each of the three interest groups, some additional field research was done. The Director of a Business Improvement District [BID] in Manhattan was contacted for a suggestion of a building management firm that might be interested in being a "prototype" – at no cost to the management firm – for a new high rise residential fire safety program for one of the firm's individual buildings. At the invitation of the BID Director, managers from a large residential building in Manhattan, Zeckendorff Towers at 1 Irving Place, agreed to review the FDNY's high rise residential safety materials and give me suggestions for improvement, acting as a kind of "focus group." A recent small fire on one of the building's terraces had made management even more enthusiastic about cooperating with prevention and safety measures.

Subsequently, I spent several hours with Zeckendorff management. We toured the building (a complex of four interconnected towers), with building employees pointing out specific features of the building that could be incorporated into a fire safety presentation. Management was asked to fill out a brief questionnaire that developed more specific information about how the employees in the building functioned (see Appendix E). The purpose of the questionnaire was to develop *consistent* information about buildings that could be incorporated into the three model presentations (Fire Department, residents, building employees). During this "tour," I took photographs of the features of the building to insert into PowerPoint presentations to be tailored for the Fire Department ("pre-fire plan"), and the residents and employees. I also asked building management about resident demographics and whether there were any "special needs" tenants in the building. Management mentioned that some apartment owners sublet their apartment, and that many of the subletting tenants were Asian and might have difficulty understanding English-language materials. This information also suggested a level of turn-over of residents in the building that was unexpected for a cooperative/condominium building (often long-term, stable tenants).

Keeping in mind the experience of FDNY and others with fire safety in office buildings, I emphasized to Zeckendorff management that they need to plan and train their staff:

- To promptly transmit alarms
- Have a thorough understanding of building systems
- Be prepared to advise tenants re evacuation or remaining in their apartments

- Know what actions staff can safely take while awaiting the arrival of the Fire Department
- Be prepared to assist the Fire Department with information, communications and operation of the building systems

Training of staff, I emphasized to Zeckendorff management, would have to consist of more than handing staff a piece of paper covered in small print about fire safety. The building's management agreed that they would train their employees during their regular employee meetings using written fire safety procedures that I would develop for their individual building.

After my visit with Zeckendorff management, I called the administrative fire company responsible for the building. I explained that I was developing a fire safety program for residents and employees, and asked the company officer for input. I emphasized to the lieutenant that any resulting "plans" could be useful for company drills for his and the surrounding fire companies. I explained that because his company knew these buildings better than other units, the administrative company's input would be invaluable in determining what features of the building should be included in the safety materials. I specifically asked the officer to review the building's inspection folder and CIDS information for items to be included in the presentations. I also arranged for the administrative battalion commander to review the materials that were developed.

I contacted one of New York's major advocates for fire safety education, Alvina Drennan and asked her for input regarding developing an effective education program. Ms. Drennan subsequently sent me written materials which I incorporated into my research.

It took me a long time to develop the building layout information in PowerPoint. There are undoubtedly many programs "in the box" that help design a building floor plan for presentations – I just did not have access to any of those programs. Another reason that I wanted to use PowerPoint was because every firehouse had access to this program on their FDNY computer. So every FDNY firehouse had the potential to be able to replicate the presentations I put together for the Zeckendorff model. One disadvantage with PowerPoint that I had to overcome/adapt was the large amount of memory PowerPoint can demand for graphics.

Another objective for the program was to be able to copy each of the three various presentations (residents, staff and fire company) on their own individual floppy disk. That way, the presentations could be easily and cheaply duplicated and disseminated – giving a floppy as well as the print-out to each new tenant, staff person and firefighter. However, now that CD-Rom burners and (and even DVD players) are so common among computer owners (but not present in FDNY firehouses), the necessity to use a floppy disk as the medium of dissemination is reduced. Each presentation was intentionally kept short – not only because people can only absorb so much information and have limited time to focus on fire safety – but also to keep down the costs of duplicating the materials.

All draft presentations included a lot of visuals – both pictures and building layout diagrams. The emphasis on visuals was to make the presentations less wordy, more "multi-lingual," and show important building features to the audiences so they would recognize these features in non-emergency situations and remember them in emergency situations.

After developing a draft fire safety presentation for the building residents and employees, I conducted a “focus group” for the program with the building cooperative board. This meeting was also intended to obtain “buy-in” from this influential group of residents. I also conducted “focus groups” at drills with firefighters from surrounding companies, going over the PowerPoint “pre-fire plan” particularly with those firefighters who had only limited contact with the building but would be dispatched early in the response (second or third due engines and ladders). Refinements and changes were made in accordance with information developed out of the draft presentations to these groups.

In cooperation with building management and the cooperative board (who assisted with outreach to the residents), I scheduled and conducted a presentation of the fire safety plan for residents in a meeting attended by approximately 75 residents (Appendix A). The fire safety plan for building employees was given to management for their use at employee training meetings (Appendix B). The “final” pre-fire plan was sent to surrounding fire companies, including the company responsible for the inspection of the building (Appendix C). The entire process of developing all three presentations for the Zeckendorff building took approximately three months.

My experience with the Zeckendorff model encouraged me to prepare a proposal that FDNY adopt this program citywide. I developed a brief step-by-step handout that explained how the program would work (Appendix D). I also sketched out some of the budgetary demands that adopting such a program would place on FDNY. I presented the proposal and the various modules of the Zeckendorff model to the Fire Commissioner, Chief of Department, director of training, Chief of Fire Prevention and numerous lower-

ranking officers. I also showed the presentation to the Fire Officers' union. Despite many positive comments, FDNY did not adopt the program.

Subsequently, I was unable to return to the Zeckendorff Towers building to evaluate the effectiveness of the program.

Results

In answer to the specific research questions investigated, this project determined that from a life safety standpoint there are three *key* groups -- groups most affected by and with the greatest stake in a high rise residential fire safety program: the residents and staff of the high rise residential building, and the firefighters who respond to that building. Although building owner associations, elected officials and others also have "interests" in such fire safety programs, their interests are more indirect.

This project determined that the needs of these three key groups often overlap. All three groups need:

- Accurate information about the building features, not just generic information but also floor layouts, communication systems, stairs, special fire protection features (e.g. hall fire alarm boxes), etc. The information in the fire safety material for the building needs some degree of specificity to convince the groups that they will in fact know what to do in *that* building, but without overwhelming people with details (too much to retain). Jargon must be eliminated and unfamiliar building features pictured.
- A clear understanding of what to actions to take in the event of emergencies in that building and what the other two groups are also doing, so that actions of all three groups are coordinated.

- Practice of the correct actions to take in the event of an emergency in that building. Practice reinforces understanding of the building emergency plan, points out areas for improvement in individual's behavior and helps identify areas where the instructional material needs to be upgraded.
- The capability to update information and train new people when necessary, for example when a new tenant moves in or a new firefighter is assigned.

As described at length in the Background and Significance and Literature Review sections of this paper, the current FDNY fire safety program for high rise residential buildings does not:

- incorporate an all-hazards approach;
- result in a "pre-fire" plan or any kind of contact between the local first responding fire companies and the building residents/employees;
- encourage each of the three key groups (residents, management/employees, Fire Department) to understand the perspectives of the other groups in order to develop greater cooperation and coordination between the groups in the event of an emergency;
- provide a written template for people who develop and deliver the fire safety information to residents and staff to insure consistency and completeness in the presentations.

This research and analysis also answered research question five re the problems and deficiencies that exist in the current FDNY fire safety program for high rise residential buildings.

From the historical analysis, literature review and field surveys, the following needs of the key groups were determined to be:

Residents	Management/Employees	FD Responder
Motivation/personal responsibility	Motivation, both personal and professional	Motivation, both personal and professional (job incentives)
Current information (updated regularly)	Current information (updated regularly)	Current information (updated regularly)
Plain language (no jargon, translated if needed)	Plain language (no jargon, translated if needed)	Information unique to that building
Self-contained – no further "research" required	Self-contained – no further "research" required	Self-contained, includes CIDS and other previously developed information
Needs information about the roles of building employees and Fire Department in event of an emergency	Needs information about the roles of building residents and Fire Department in event of an emergency	Needs information about the roles of building employees and residents in event of an emergency
	Information on how to ensure residents and staff are properly prepared	Training on how to prepare individualized fire safety plans
Hands-on practice (drills)	Hands-on practice (drills)	Hands-on practice (drills)
Clear understanding of whether to stay/go and other actions to take (close door, etc.)	Clear understanding of job tasks in various emergencies	Awareness of the preparedness level of the building residents/employees
Better communication to staff and FD	Better communication to residents and FD	Better communications to residents and staff

As the chart shows, the needs of the key groups seem alike but each group is approaching a need from its different perspective and its different role in an emergency. By each group having a better understanding of the differing perspectives and roles of all groups, the specific needs of each group will be better addressed and all groups should function better together.

The model program was designed to address the needs of the individual key group and also make them more aware of the functions of the other groups. The three presentations were very similar in content. In addition, all groups were made aware that they had to take into account the other key groups' specific functions in an emergency. This aspect of the model program was also designed to address research question six re how to design the program to encourage the key groups to work together. By emphasizing at the program's onset that it is a cooperative effort that requires all the groups to work together in partnership for the program to be successful, the various groups will be encouraged to work together. The model program also furthered this goal

by requiring the person developing the three presentations to consult with all the groups and encourage the groups to consult with each other in the future.

Attached in Appendix A is “A Guide for Residents” print-out of the PowerPoint presentation developed for residents of the high rise building Zeckendorff Towers. Immediately (the second slide/page), the tenants are presented with “motivation” for learning about their building. The third slide (page) starts the presentation with what many tenants identified as the most confusing issue about how to behave in a fire: knowing when to get out. This issue is revisited later in the presentation when residents of that building are told how to act (whether to stay or go) in *that specific building*. The presentation concludes with pictures with descriptions of important features that are specific to that building: the four separate towers, the apartment telephone linked directly to the desk at the building entrance, etc.

Appendix B, “Emergency Planning for Staff,” the PowerPoint presentation for building staff similarly starts with the “motivation” for staff to learn about fire safety for the building in which they are employed. They are given a list of important features of the building along with pictures and diagrams of different (critical) floor layouts. The presentation reminds staff to know their residents, and to regularly check and maintain building features. The presentation concludes by specifically setting out what staff is to do in the event of a fire.

Appendix C “Emergency Planning,” is the PowerPoint for local fire companies and is intended to serve as a simple “pre-fire” plan. The plan starts with the building entrance and takes firefighters up and through the building, identifying important features and concerns for that particular building from the ground up (as the firefighters would

travel up through the building). Diagrams and pictures of important floors (e.g., the sky lobby) are included. The presentation also includes the Fire Department's Critical Incident Dispatch (CIDS) information for the building.

And finally, Appendix D includes the "Step-by-Step Method for Developing Fire Safety Education and Emergency Planning Presentations for High Rise Residential Buildings for Residents, Staff and Surrounding Fire Companies." The intention of this guide was to provide consistency and assistance to people trying to apply this "model" to other buildings. By describing the process undertaken for Zeckendorff Towers, it was hoped that this guide could explain how to apply the process citywide.

Discussion

In reviewing the results of this project and comparing the process with the Community Risk Reduction Model posited in my Executive Fire Officer program, it is clear that I skipped a number of steps of the model and modified others. The actions that I did take via my historical research, literature review, field research and testing, and development of an "action" product could be listed as:

Getting Ready	Assessing Risk	ID Strategies	Take Action	Evaluate
Understand risk reduction	Analyze the community	ID potential strategies	ID needed resources	Evaluate results
Accept personal responsibility	ID hazards and causal factors	Analyze cost	Develop implementation schedule	Report results
Develop personal vision	Assess vulnerability	Select risk reduction strategies	Assign responsibility	
Evaluate authority and politics	Establish priorities	Develop an evaluation strategy	Gain policy approvals	
Develop project plan				

Steps in the community risk reduction model that I overlooked or minimized included:

- Establishing priorities based on rated risks
- Defining acceptable risk

- Creating a risk reduction objective (measurable)
- Evaluating results – results were evaluated only in the very short term with respect to this particular building; longer term evaluation was needed
- Modifying the risk reduction initiative – because this project did not go beyond the initial contacts with this individual building, the initiative was not evaluated and modified

In planning for, developing -- but most of all -- in implementing this project, it was also recognized that for any program of this kind to be applied on a broader scale, many more groups would need to be involved. Ultimately, the failure of the Fire Department to use this program as a possible model for legislative requirements, the failure of residents and building employees to be more pro-active about fire safety in the wake of many high-profile high rise residential incidents, the inability of the project director (myself) to continue with the project and build support, the resistance of the real estate industry to more stringent requirements for residential buildings – all contributed to the failure of this model program being carried forth in New York City.

If I were to do this process again, I would start with basic questionnaires for the building residents and staff to determine their *initial* level of knowledge about fire safety and fire prevention, especially with respect to their building. In addition, I would develop statistics for the building and for that type of building/neighborhood so that priorities based on rated risks could be defined, a risk reduction objective could be established, and the program's results could be better evaluated. Then, after the presentation of the program to the staff and residents, I would follow-up with two more brief questionnaires – one immediately after the presentations to gauge how well the

audiences learned the material and one a year or so later to see how well the information continued to be disseminated and retained. The results of these questionnaires would be used to evaluate and improve the program.

The presentations should be overhauled to make the points more direct and the presentations more comprehensive. This change would be made easier because it is no longer technologically and economically necessary to keep the presentation short for duplication purposes (it is as cheap and easy to use a CD-Rom as the medium as a floppy).

The scope of the program needs to be broadened to make clear to building staff and residents that the procedures for fire would also be applicable to other types of events such as power outages, and hazardous materials and terrorism incidents. The recent East Coast blackout and 2001 attacks on the World Trade Center have made New York City residents highly aware that they may not always have someone coming to "save" them from danger and that they need to learn specific actions to take in the event of emergencies.

A "drill" program for the building to use with residents and staff should be developed similar to those required by Local Law 5 for high rise commercial buildings. Representatives of the Fire Department would be present at the drill to act as "responders," assist and evaluate whether residents and staff were able to act correctly in the event of an emergency. The results of the FDNY critique would be given to residents and staff so that people could modify their behavior if needed and also to encourage the continuation of such drills. These drills would also point to gaps and needs in the written program where improvements needed to be made. The drills could also encourage

residents and staff to continually review their building fire safety information by providing a dramatic example of how that information needs to be understood and applied correctly. For instance, if a tenant is told not to use a certain staircase during the drill and has trouble finding another staircase or is locked out of his/her apartment, that tenant would have a concrete example of the importance of knowing his/her building.

Another component of this "drill" would be the inclusion of FDNY fire companies who would not normally inspect the building, but would be called on to respond in the event of an emergency. Prior to the drill, these fire companies would prepare by reviewing the emergency plan for the building.

My project should have done more to address "special needs" tenants such as the physically disabled and people whose first language is not English (both staff and residents). This information about the building should be researched and incorporated into the various presentations.

A mechanism should also be developed to encourage the tenants, staff and firefighters to regularly review the information about the building and practice the procedures. Ideally, should the City fail to require such review, the building management, tenant association and local fire companies could schedule bi-annual or annual "drills" at the building. An updated (when necessary) building emergency plan could be sent to residents every year along with their lease renewal or other mandatory annual tenant notices (e.g. window guards).

Recommendations

At this point in time, FDNY is drafting new rules for fire safety plans, training and drills for high rise commercial buildings. The Department should take advantage of this opportunity to provide the same level of "service" for high rise residential buildings. As people learn the information and practice the actions required by the new *commercial* requirements, they may be more open to learning the same information and practicing similar activities for their residences. The FDNY needs to search out and then network/partner with fire safety "spark-plugs" such as the Skyscraper Safety campaign and others to include residential buildings – after all, more people die in high rise residential fires in New York City than in high rise commercial fires. With the assistance of these partners, FDNY should initiate legislation to require the same rules for residential as commercial high rises, including upgraded communications systems.

The model individualized building emergency plan developed by this project could be enhanced and applied throughout the City. Legislation should incorporate such a fire safety planning program as a requirement for high rise residential buildings. FDNY could develop a fee-for-services program to create such plans for every high rise residential building similar to other fee-for-service programs such as boiler or elevator inspections.

FDNY needs to expand its approach to building safety beyond the hazards of fire to make the public, elected official, advocacy groups, et al. aware that FDNY programs are intended to prepare people for all-hazards safety, including terrorist incidents. The public (including firefighters in the field) is looking for leadership about what to do in the event of another attack. Right now, that vacuum is being filled by the New York City

Police Department. But it will in fact be FDNY that will be responsible for "mitigating" such incidents – firefighters will be handling the brunt of dealing with victims, trying to avoid becoming victims themselves, controlling the building's systems and evacuation, etc. FDNY high rise "fire safety" proposals in fact are applicable to much more than fire emergencies and FDNY needs to broaden its approach to expand the public's support for FDNY programs.

The media should be recruited as an important partner in this all-hazards education effort. FDNY needs to develop a more sophisticated use of the media to show people how all-hazards safety programs are needed. FDNY needs to determine how the public's current state of heightened uneasiness about terrorism, natural disasters, etc. can be channeled into a willingness to devote resources to emergency planning. At present, even FDNY's annual Fire Safety Week programs receive very little attention in the media. FDNY needs to develop media advocates for safety.

FDNY needs to expand its fire safety training for firefighters and officers. Pre-fire plan training should be included for all the ranks, including the Probationary Firefighter School, First Line Supervisors Program [FLSP] (for newly promoted lieutenants), Captains' Development Program and Battalion Chiefs' Command course. The training should emphasize learning to recognize the importance of the demographics of buildings – tenant "characteristics" such as physical disabilities, language problems, and cultural differences – as much as current training emphasizes recognizing the importance of building construction. More emphasis should be put in training in preparing uniformed employees to *work with* communities and other organizations to achieve fire and emergency safety. FDNY employees should be trained to develop "skill

sets" for prevention and education in the way that they are trained to develop a suppression skill set. Learning to evaluate the success of FDNY programs must become an integral component of the skill sets.

A package of "templates" incorporating the models developed for this project could be given to company officers for application in their own administrative districts. In districts with numerous high rise residential buildings, fire safety "task forces" or "strike teams" from headquarters could assist the company officers with initiating and leading the development of emergency planning for their buildings.

High rise *residential* fire safety should become one of the strategic objectives for FDNY's Bureau of Fire Prevention and be included in the FDNY 2005-2006 annual strategic plan. As part of achieving that objective, the Department needs to do more research on other departments/organizations' approaches to high rise residential safety.

FDNY needs to develop a system of incentives for uniformed personnel to learn about and develop a commitment to fire safety education and fire prevention. More full duty uniformed personnel need to accept assignments to FDNY Bureaus of Fire Safety Education and Fire Prevention. The Department should develop incentives that make assignment to these units an advantage in getting promoted – e.g., as a way of accumulating college credits or in lieu of college credits. FDNY should also consider revising its promotional criteria to require assignment to Fire Safety or Fire Prevention as a prerequisite to being promoted to Captain. Some of those assigned to these Bureaus should be assigned to do research on other departments/organizations' approaches to high rise safety.

FDNY needs to do more to influence building owner groups such as the Real Estate Board to adopt stricter fire safety practices and codes. Persuasion could include providing owner groups with information that demonstrates the economic benefits of the stricter requirements and the true economic costs of a failure to protect residents, staff and firefighters.

And finally, FDNY should prepare fire safety programs in advance, to "roll out" when the next disaster strikes. Rather than always play "catch-up," FDNY has to develop the capability to think ahead strategically. Preparation has to include not only the content of such programs but also the strategy to insure their adoption. Having "model" programs such as the one I developed for this Executive Fire Officer project, would at least provide a jumping off point for discussion and even legislation. FDNY also has to do more to evaluate both new programs and old. At present, there is little or no way to determine whether FDNY fire prevention and fire safety programs are successful because evaluations of such programs are rarely done.

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